UNION CARBIDE

NUCLEAR DIVISION NEWS

A Newspaper for Employees of the Nuclear Division, Union Carbide Corporation

Vol. 4 — No. 24 December 21, 1973

QUESTION BOX ??

If you have questions on company policies, benefits, etc. or any other problems with which we might help, just let us know. Drop your inquiry to the Editor, **Nuclear Division News.** *(Or telephone it in to your plant news representative.) You may or may not sign your name. It will not be used in the paper.*

Questions are referred to the proper authorities for accurate answers. Each query is given serious consideration for publication.

Answers may be given to employees personally if they so desire.

QUESTION: I have been ill through the years, off and on . . . legitimate illnesses . . . surgery, car accidents, two nervous breakdowns. I recently received my fourth written reprimand for my attendance. This aggrevates my mental condition. What is the company policy on harassment?

ANSWER: Our basic responsibility is to conduct the activities at the facilities we operate in the most efficient and economical manner. A satisfactory level of attendance by all employees is necessary in order to meet this responsibility. Naturally, if absenteeism is due to illness or other legitimate reasons, the Company is more tolerant toward it. However, there is a limit concerning how much absenteeism can be permitted.

If absenteeism is excessive, a supervisor is expected to discuss this with an employee. In addition, if legitimate absences are excessive over an extended period of time, a supervisor will normally give the employee a written notice that he is not meeting the requirements of his job. This notice is not intended to harass the employee, but is intended to make him aware of the fact that continued excessive absenteeism, regardless of the circumstances, may result in termination.

QUESTION: Why aren't the women in Y-12 informed of the draftsman trainee and the engineering aide training programs? It seems that the only way women in this plant are made aware of these training programs is by hearing about them from other women who have been fortunate enough to be selected for the programs. Why can't the women be informed fully about them and told when there are such openings in these training programs?

ANSWER: People in these job titles are not engaged in formal classroom training, but are usually expanding existing skills by means of on-the-job training. The numbers are small — 20 (including five women) in June, 1972, and 16 (seven women) in June, 1973. During the last two years, only five people (four women) were promoted into these jobs. The candidates were selected after a review of personnel folders and recommendations by supervisors. An employee does not have to be aware of these openings to be considered. Nevertheless, to prevent any difficulty, you should feel free to advise your supervisor and, in turn, the employment office of your specific interest. Also, be certain to keep your qualification record up-to-date by advising your employment office of any scholastic or experience additions, plus a copy of certifications, etc., for inclusion in your personnel files.

QUESTION: As one who has unsuccessfully complained to the chairman of our monthly safety meetings, I would like to know why a "no smoking" rule isn't made and enforced in such forced gatherings? Or, have separate meetings for nonsmokers?

One cannot concentrate on the meetings with the burning eyes, and choking in the heavy smog created by smokers in these one-hour gatherings.

ANSWER: Safety meetings are held for the purpose of information exchange on items relating to the safety of any and all employees. Certainly, a meeting held under the conditions you describe would not be conducive to the serious matter of learning about potential safety problems. While it may not be practical for your

(Continued on Page 8)

Buses begin for passengers commuting among three plants

Passenger bus systems have been initiated between Oak Ridge National Laboratory and the Y-12 Plant; as well as ORNL, Purchasing at Townsite, and the Federal Office Building (Atomic Energy Commission). A similar system has begun, carrying passengers between the Oak Ridge Gaseous Diffusion and Y-12.

Y-12's East Portal will serve as a transfer point for ORGDP employees wishing to transfer to AEC, Purchasing or ORNL. They will depart from East Portal on the hour and half-hour.

All buses are operating on 30-minute intervals, and schedules have been distributed throughout the three Oak Ridge installations.

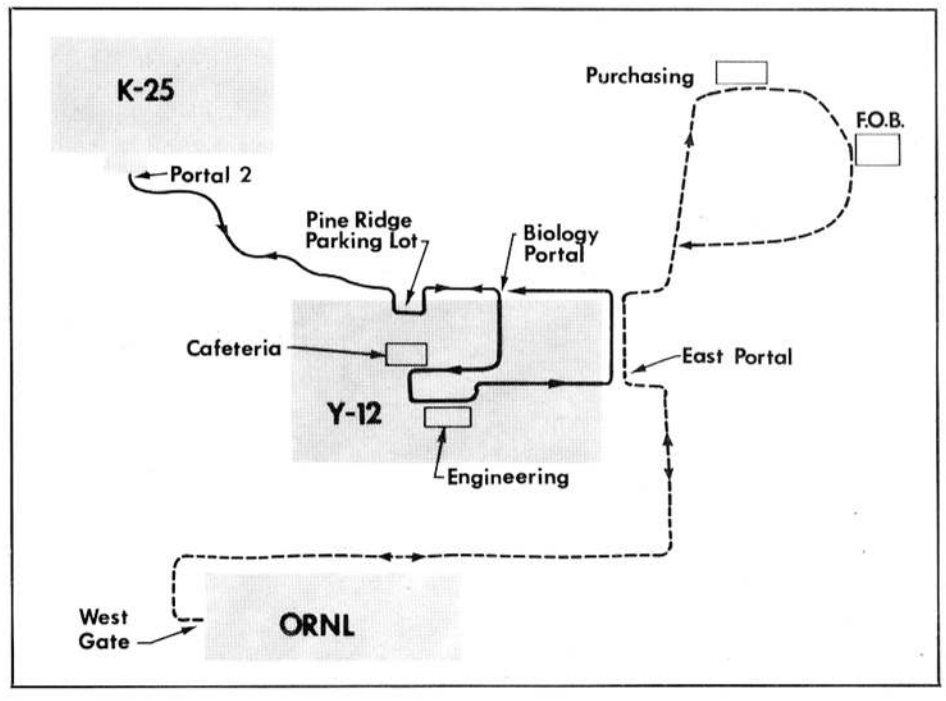
A temporary schedule exists at ORNL, and a revised edition will be issued the first week in January.

Bus stops at ORGDP include the Main Portal; at Y-12, Pine Ridge and West Portal, Biology Portal, 9711-5 Southeast corner, 9733-1 and East Portal. ORNL stops include west of the 7000 area, Building 5000, West Gate and the flag pole at Building 4500.

Up-town stops include Purchasing (and Central Employment), and the Federal Office Building.

It is believed that bus service will better utilize fuel allocations in the above manner, rather than have passenger cars transporting personnel among the various plants.

The map below (not to scale) shows the routes taken by buses between the plants.



Holiday schedule gives employees long week-ends

Monday and Tuesday, December 24 and 25, are official holidays for all Nuclear Division employees.

Oak Ridge employees will observe the following schedule beginning Monday, December 31. New Year's Eve will be our normal scheduled day off for the week, and we will work Saturday, January 5. This will afford Oak Ridge employees two four-day week-ends in a row.

Paducah employees have Tuesday, January 1 as a holiday. Nuclear Division employees enjoy a total of 10 paid holidays a year.

Next Issue

The next issue will be dated January 5. The deadline is December 26.

Season's Greetings

78854

Reactor Division's test rigs simulate LMFBR operations

By R. L. Wesley

Two large experimental rigs are being operated by ORNL-Reactor Division personnel in support of the U.S. Atomic Energy Commission's Liquid Metal Fast Breeder Reactor (LMFBR) Program.

A demonstration LMFBR, designed to produce electrical power and create additional nuclear fuel, is scheduled for operation in Oak Ridge in the 1980's.

The ORNL test rigs, located in Building 9201-3 in Y-12, are the Fuel Failure Mockup (FFM) and the Thermal Transient Test Facility (TTTF). Both rigs, each approximately two stories tall and shielded by metal walls, are for testing the effects of liquid sodium coolant on simulated reactor components. There are no nuclear materials in the test rigs and the sodium is heated electrically.

19 heater rods used

The FFM, which began operation in 1970, is designed to determine what happens in the unlikely event that a blockage occurs within a reactor core and prevents proper coolant flow. It has also provided basic core heat transfer data for the Fast-Flux Test Facility (FFTF), a sodium-cooled test reactor now being built at Hanford, Washington.

In this rig a portion of a nuclear reactor fuel rod bundle is simulated by a number of high performance electrical heater rods. Each rod is approximately 60 inches in length and 0.230 inch in diameter. The heating element inside is 18-24 inches long and 0.125 inch in diameter and is rated for 24.5 killowatts (enough to heat a three-bedroom house if the heat could be equally distributed). Nineteen heater rods have been used in all bundles tested to date in the FFM, this number requiring about one-half megawatt of heat input to the test bundle.

Additional tests planned

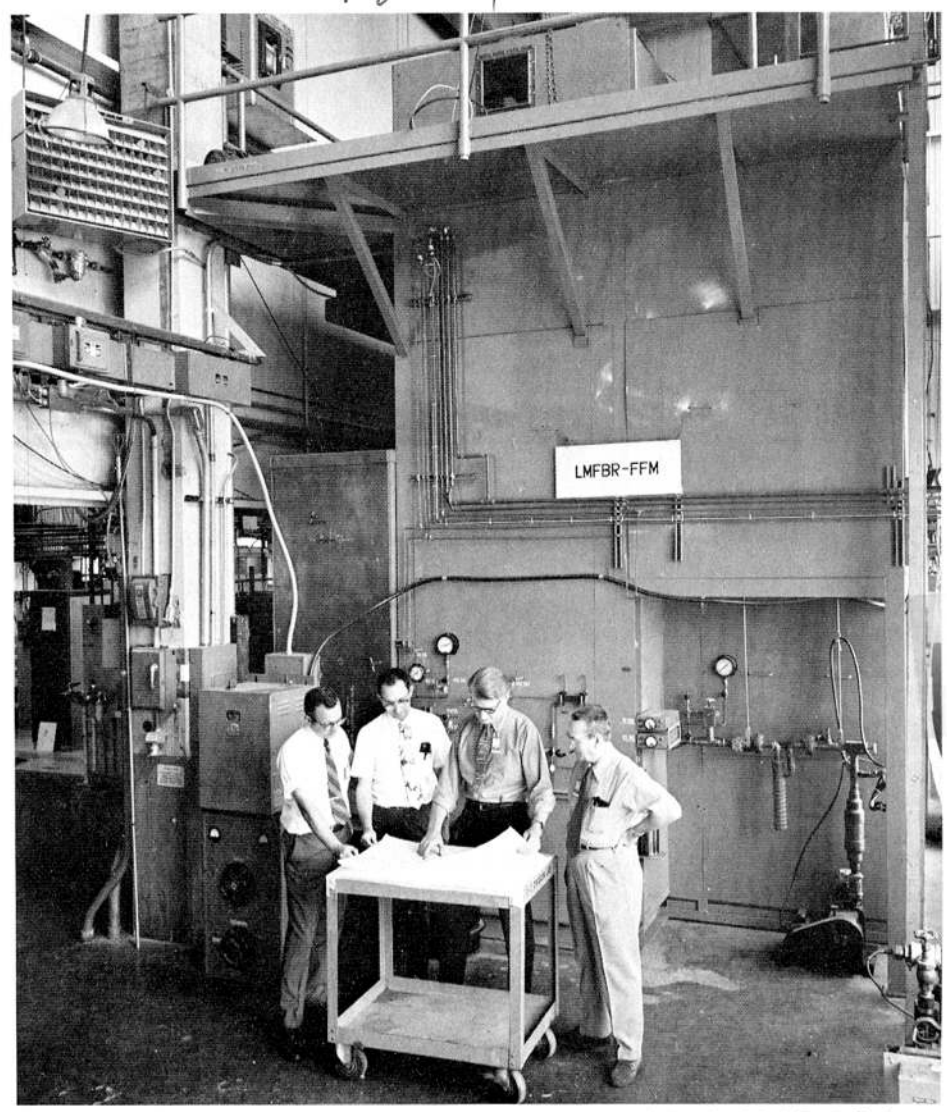
The liquid sodium is normally heated to 600°F before it enters the simulated fuel bundle. The exit temperature from the bundle is normally between 600 and 1000°F, but operation to 1300°F is possible. Temperatures are measured with thermocouples installed inside individual heater rods, built into spacers that separate the rods one from another to form channels for the sodium coolant, and attached to the containment pipes carrying the sodium coolant.

Early tests established temperature profiles in the bundle under normal operating conditions. Additional tests have simulated blockages that conceivably could occur in an actual reactor. Results of experiments thus far indicate that blockage of a fairly large number of channels at the entrance to the pins in a fuel assembly could be tolerated without causing serious damage to the reactor. Additional tests will examine in-core and exit blockage locations. Facility modifications planned will involve the use of a 37-pin bundle of simulated reactor fuel rods capable of producing about two megawatts of heat.

The program is under the direction of Mario H. Fontana, Manager of LMFBR Safety and Core Systems Programs, and Robert E. MacPherson, Head of the Reactor Division Experimental Engineering Department which is responsible for the operation of these rigs. The project leader for the FFM is Paul A. Gnadt and he is assisted by Glenn E. Mills and Henry E. Penland. Thomas S. Kress, Lewis F. Parsly, and John L. Wantland are involved in experiment planning, evaluation of test results, and application to reactor systems.

Reliable methods needed

The second test rig, the TTTF, began operation in December 1972 and is designed to study structural problems that can be caused by the fast temperature changes that can occur in an LMFBR. Because of the good heat transfer characteristics of sodium, changes that occur in reactor power, particularly during quick shutdowns, can cause rapid temperature drops in the flowing sodium coolant. The effects of these rapid temperature drops can produce cumulative deformation (ratchetting) and fatigue of the materials of which the sodium piping and components are made. LMFBR designers need reliable analytical methods to calculate these effects and the ORNL High-Temperature Design Methods Program is charged with meeting these needs. The experimental program for the TTTF, under the technical direction of James M. Corum, is being conducted under closely controlled, realistic conditions to obtain carefully measured data to develop and verify the required analytical methods.



PLANNING FFM EXPERIMENTS — Standing in front of the shielded Fuel Failure Mockup rig, Mario H. Fontana, Paul A. Gnadt, Robert E. MacPherson, and John L. Wantland make their plans for future tests in support of the Liquid Metal Fast Breeder Reactor program.

Initially the specimens being tested are straight lengths of pipe, 8-in. diam x 0.375-in. wall x 30-in. long, from a well-characterized heat of 304 stainless steel which is being used throughout the ORNL program to develop high temperature design methods. After a period of hot sodium shakedown of the rig from December 1972 to March 1973, the first test specimen was installed in April 1973 and was removed in November 1973. For most of the test the specimen contained sodium at 700 psig heated to 1100°F. The specimen was also subjected to a total of 14 thermal transients at prescribed intervals during which it experienced temperature drops of 300°F within a 10-second period. These abrupt temperature drops exceed those that the actual reactor components would be expected to experience, according to MacPherson. The results of the initial tests are very encouraging. Despite the severity of the transients, the dimensional changes were small and the specimen did not fail. The experimentally measured deformations agree well with analysis predictions using calculational methods developed by ORNL and recommended for use in design analyses of LMFBR components.

Additional tests to be performed in the TTTF during the next few years will investigate the effects on ratchetting of geometry, materials, and operating conditions. Albert G. Grindell coordinates the program for the Experimental Engineering Department. Harry C. Young is the project leader and is assisted by Glenn W. Greene and W. Hardin Duckworth. Jack E. Smith and Thomas G. Hill are responsible for the high-temperature strain measurement devices.

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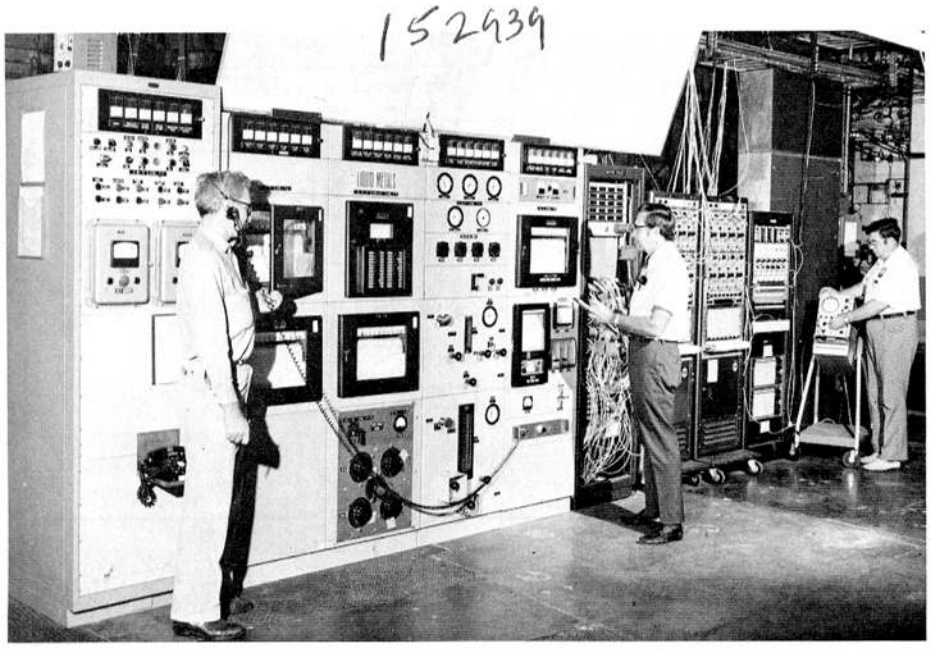

OPERATING THE TTTF — Monitoring controls on the Thermal Transient Test Facility are (from left) W. Hardin Duckworth, Harry C. Young, and Glenn W. Greene. The test rig is used in a study of the effect of rapid temperature changes on a reactor component.

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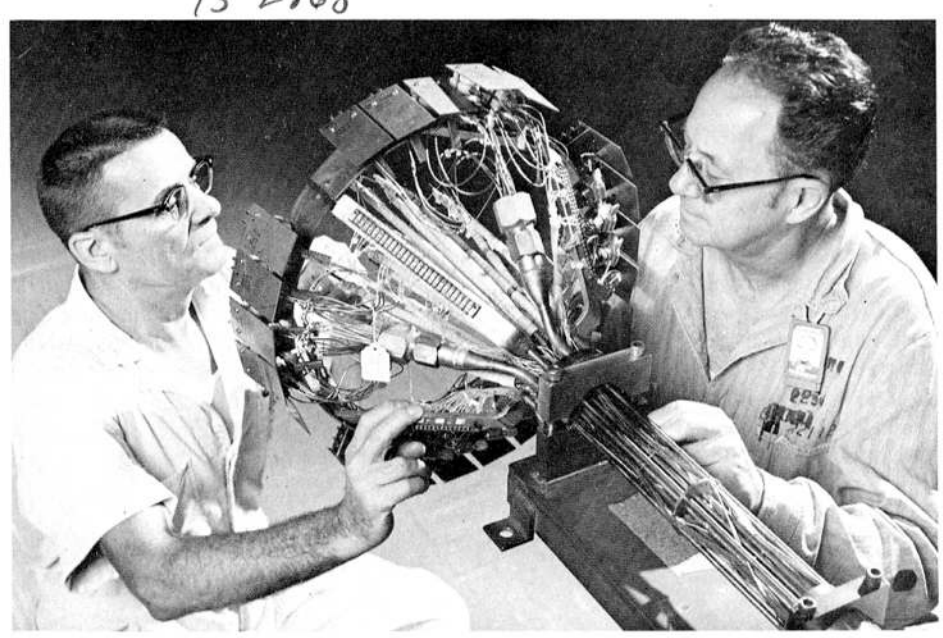


FFM TEST BUNDLE — Taylor L. McCreary and Milton Carlton inspect a heavily instrumented bundle of rods with internal heaters designed to simulate a reactor fuel subassembly.

Energy and Monetary Savings from Using Optimum Insulation

	Energy Savings, % Gas - Electricity		Monetary Savings $/yr.
Atlanta			
Gas Heat	18	+	0
Gas heat + air cond.	9	7	3
Electric heat	—	44	51
Electric heat + air cond.	—	32	42
New York			
Gas heat	28	—	4
Gas heat + air cond.	34	18	9
Electric heat	—	35	80
Electric heat + air cond.	—	33	88
Minneapolis			
Gas heat	9	—	5
Gas heat + air cond.	9	8	6
Electric heat	—	9	39
Electric heat + air cond.	—	9	40

Use of insulation at home conserves energy and cash

By John C. Moyers

We all have been hearing about impending fuel shortages and rising costs of electricity, natural gas and fuel oil. Are you personally concerned about the cost of heating your home, or even about your ability to obtain enough fuel to get through the winter? Are you also worried about the damage to the landscape caused by surface mining to provide coal for the power plants that furnish you and your neighbors with the electricity so necessary for our way of life? If so, some of the results of studies being conducted by the Energy Group of the ORNL-NSF Environmental Program may be of interest to you.

This group has been examining the ways energy is used in the home and has been searching for ways to reduce energy consumption and yet maintain approximately the same level of comfort that we now enjoy. Some of the most significant findings are in the area of thermal insulation for homes.

Thermal insulation retains heat

Heating to maintain comfort during the winter is the largest single use of energy in the home, accounting for about half of the total. All of the energy used for heating ultimately leaks to the outside environment and is lost. The function of thermal insulation is to retard the leakage and, because all heat leaks must be made up by burning fuel or consuming electricity, to reduce the energy required to maintain the desired comfort level.

Currently, the only building code requirements for insulation in homes are those included in the Federal Housing Administration's Minimum Property Standards. These standards must be compiled with if a new home is to qualify for FHA financing. At present, only about one-third of new housing construction is financed through FHA; the other two-thirds isn't covered by any mandatory requirement for thermal insulation. California has recently enacted legislation that requires ALL new residential construction to comply at least with FHA thermal insulation requirements.

FHA standards

In examining the effectiveness of different amounts of insulation in homes, the Energy Group found that even houses insulated in accordance with FHA standards fall considerably short of the ideal from the standpoint of conserving energy and saving money for the homeowner.

The optimum amount of insulation varies with the type of heating system and the climate. Energy and monetary savings that would result from using optimum insulation beyond that required by FHA have been calculated for various cities representative of different climates in the United States, and for different heating and air conditioning systems. The results are given in the table above. The monetary savings are net savings that would accrue each year of the life of the home and include paying off the initial cost of the extra insulation.

The largest energy savings occur in the milder climates and with electric heat. The FHA standards tend to provide adequate insulation in areas having severe winters, but are deficient in areas with milder climates. Electricity is a relatively expensive form of energy for heating; hence, more insulation is economically justified and the energy and monetary savings that result are larger.

Re-insulating old homes

This sort of information is all well and good for the person building a new house, when insulation can be installed easily and the size of heating and air conditioning equipment can be reduced to fit the lower heating and cooling loads. But what can the owner of an existing home do, economically, in the way of re-insulating?

There isn't much that can be done easily to improve the vertical walls. A vapor barrier is needed on the warm side of fibrous insulation to prevent moisture condensation within the bulk of the insulation. While the vapor barrier can be installed easily as the house is built, there isn't a good way to put one in an existing finished wall.

Ceiling insulation, however, can be installed readily in existing homes, either as glass fiber batts or blown glass fiber or mineral wool. Installing 3½ inches of glass fiber insulation in the ceiling will reduce the heat loss through the ceiling by 80 percent, compared with an un-insulated ceiling. In a gas- or oil-heated home in Oak Ridge, the cost would be recovered through lower fuel bills in less than five years, if a 6% interest rate is used for the money involved. In an electrically heated home in Oak Ridge, six inches of ceiling insulation will reduce the ceiling heat loss by almost 87 percent, and will pay for itself in less than three years. Furthermore, if the houses are air conditioned, additional savings in the cost of electricity for air conditioning will be realized.

Storm windows help

Storm windows often can be installed in an existing home and will help plug one of the major heat leakage paths in the home. Heat loss through the windows will be reduced by about one-half. In an electrically heated Oak Ridge home, storm windows costing $1.50 per square foot will recover their cost in about seven years. The cost would be recovered in 10 years in the oil-heated home, or in 20 years in the gas-heated home. As in the case of ceiling insulation, storm windows would also reduce the air conditioning load in the summer.

All of these recovery periods are based on present-day costs for fuel and electricity. All predictions are that these costs will increase appreciably in the years ahead, making insulation and storm windows even better investments.

Reset thermostat

Another step the homeowner can take immediately to reduce his energy consumption for heating - one that has been widely prescribed recently - is to reset his home thermostat to a lower temperature during the winter. Each degree of thermostat lowering will save about five percent of the heating energy required for the home. Further lowering of the thermostat at night upon retiring also provides an appreciable saving of energy. A recent study by Honeywell, Inc., shows that a 5° F turndown between the hours of 10 p.m. and 6 a.m. provides a saving of about 10 percent in a climate similar to Oak Ridge's. A 10° F turndown would provide a saving of 14 percent.

So, don't sit and stew about the problem of fuel shortages and high prices. Do something about it. You can conserve energy and probably make money doing it!

Nuclear Division employees 'pool it' and save energy

The Nuclear Division's program to promote car pool participation has been put into effect and some of the data has already been punched into the computer, according to David Pilati. Pilati developed the program, and is currently serving as one of the coordinators.

To date, information from 11 divisions at ORNL, involving 1,921 employees, has been computed. Results show that 80 percent of the forms issued to employees in these divisions were returned. Sixty-six percent of the employees who returned forms indicated an interest in participating in the program.

Some examples of the reasons given by employees, who indicated a lack of interest in participating are:

"I work shifts, which change periodically;"

"I have an irregular work schedule. Sometimes I work late to finish a project or experiment, and often I have to come to work as early as 4 a.m."

"I already participate in a car pool."

"I would like to receive the information, but would not want to join a car pool at the present time. If I indicate a yes answer, what will my neighbors think when I tell them I don't want to join?"

It is agreed that joining a car pool may cause inconveniences to some employees, but the savings on gasoline and money will offset the inconvenience, in many cases.

ORNL employees should have a copy of the computer printout of other employees who live near them after the first of the year.

The forms from ORGDP employees are ready for processing. It is estimated that the percentage of returns is even greater than 80 percent.

Some Y-12 employees have returned their forms, and others will receive forms during the December safety meetings. Hopefully, all forms from the Y-12 Plant will be in by December 21.

The Paducah Plant, which currently has a load factor of 2.7 passengers per car, is aiming at an impressive four-passenger-per-car load factor. The program at Paducah, which will involve the use of 10 grid maps instead of the six used in Oak Ridge, is being developed. It is hoped that the processing of forms there will begin by mid-January.

If you work at one of the three Nuclear Division plants in Oak Ridge and have not been contacted about the car pool program, contact your division representative or one of the coordinators. The coordinators are: Robert Newton, ORGDP, Dave Pilati and Gerry Johnson, ORNL; and George Evans, Y-12 Plant. Paducah's coordinator is Keith Bryant.

Do your part to aid in the energy crisis and save money too! **Pool it!**

Y-12 PLANT

RIDERS WANTED from Karnes to North or Central Portal, straight days. Pat Weaver, plant phone 3-7751, home Powell 947-8442.

RIDERS WANTED or WILL JOIN CAR POOL from South Clinton to the East Portal, straight days. O. B. "Badeye" Harness, plant phone 3-5308, home 457-3402.

RIDERS to any portal from West Town area, via Kingston Pike, Cedar Bluff Road, Interstate to Oak Ridge Connector. Jim George, plant phone 3-7277, home phone Knoxville 588-6474.

ORNL

JOIN or FORM CAR POOL from East Village area, Oak Ridge, to either Portal, 8:15 shift. L. C. Templeton, home phone 483-0492, plant phone 3-6652.

Division Retirees

A host of long-time Y-12 Plant employees are retiring at the end of December.

Avant Beeman

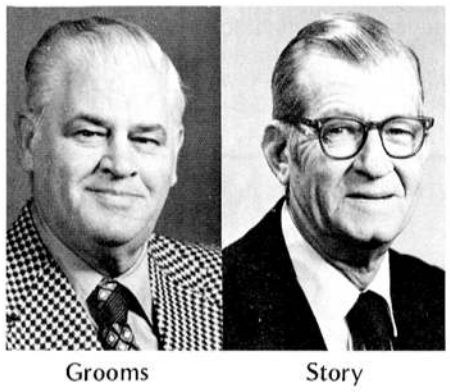
Included are Howard S. "Pete" Avant of the Development Division. He lives at Route 4, Clinton.

Product Certification's James W. Beeman lives at Route 3, Oliver Springs, Tenn.

George Jones

Clem Jones, who recently attained 30 years' service with Union Carbide, is in the Materials and Services Division. His home is at Wartburg, Tenn.

Fred M. George of the plant protection department lives at 4407 Hinton Road, Knoxville.

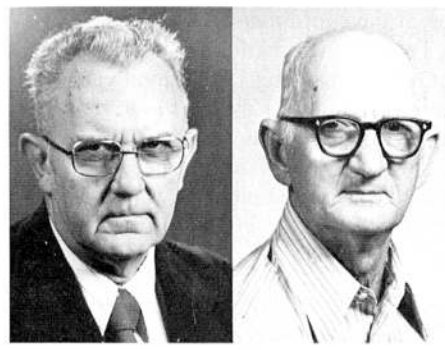


Grooms Story

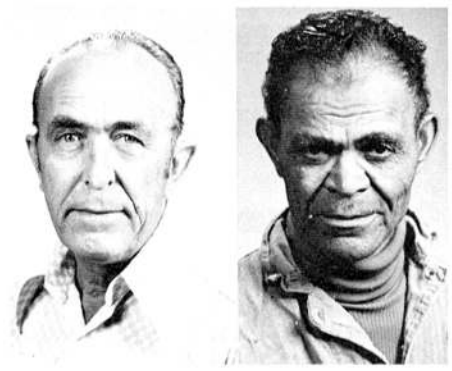
Tolliver

Metal Preparation announces three retirees: Gordon A. Grooms of Route 17, Knoxville; Willard G. Story of 142 N. Jefferson Cirle, Oak Ridge; and L.A. Tolliver, 107 ½ N. 12th Street, Lafollette, Tenn.

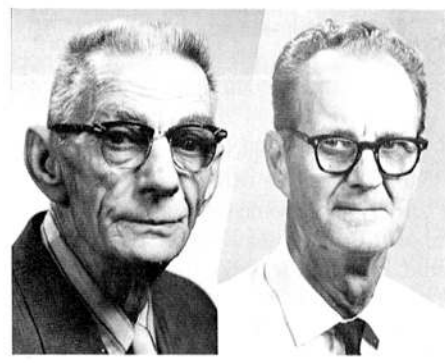
Eleven Maintenance Division employees are retiring. All are taking early retirements except one.



Alspaugh Boggs

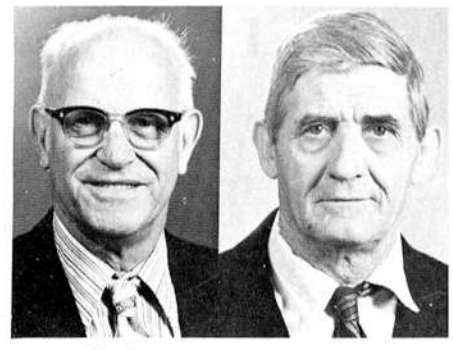


Ivy Johnson



Kennedy Land

McCreary McCullough



Peake Wyrick

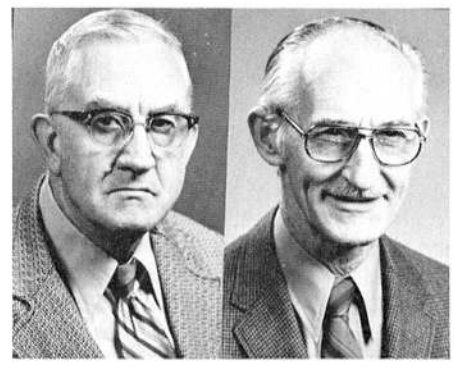
Uriah L. Alspaugh lives at 122 Meadow Road, Oak Ridge; Graham Boggs' home is at Route 1, Lake City, Tenn.; another Lake City resident, Kermit L. Duncan; and Briscoe W. Ivy, who recently celebrated 30 years' service with the Company, lives at Route 2, Cherokee Drive, Seymour, Tenn.

Eddie Johnson lives at 1801 Birdsong St., Knoxville; another 30-year employee, John L. Kennedy, lives at Route 17, Laurel Oak Lane, Knoxville; and Tyrus C. Land, whose home is at Route 5, Clinton.

Taylor L. McCreary also lives at Clinton; Ernest M. McCullough, who is taking normal retirement, lives at 304 Firestone Rd., Oak Ridge; Sam B. Peake's home is at 2434 Kantebury Drive, Knoxville; and Mack D. Wyrick lives at Route 1, Kingston.

Eight early retirees and one normal retiree leave the Fabrication Division:

Barwick Duck



Lamb King

McCarty Neal

Rodgers Wheeler

Duncan Winfree

Walter R. Barwick lives at 7612 Berkshire, Powell, Tenn.; Ova C. Duck of Route 1, Rutledge, Tenn.; and William C. King of Route 29, Holland View Drive, Knoxville.

Ersey O. Lamb lives at Route 2, Bull Run Road, Powell; Joseph S. McCarty, of 100 Maple Lane, Oak Ridge; and James R. Neal lives at Route 4, Ruggles Ferry, Knoxville.

William H. Rodgers' home is at 521 Oak Street, Athens, Tenn., Floyd C. Wheeler, who is taking normal retirement, lives at 207 Highland Ave., Oak Ridge; and R. Clarence Winfree, another 30-year employee, lives at Route 3, Kingston.

Sharpe

Joe F. Sharpe retired recently from the Plant and Equipment Division at ORNL. Sharpe, a pipefitter, had worked at ORNL for over 20 years. After a brief trip to Arizona to visit a sister whom he hasn't seen since 1940, Sharpe can be found at home on Outer Drive in Oak Ridge.

73-3106

Mrs. Coley

73-2805 73-2944

Smoot Gross

ORGDP announces three more retirees for the end of December:

Alice C. Coley, Isotopic Analysis, lives at 173 Hamilton Circle, Oak Ridge.

Barrier Manufacturing's William S. Smoot lives at 1100 Cedar Lane, Knoxville.

Alvis Gross, who is in the Fire and Guard Department, lives at 103 Ulysses Lane, Oak Ridge.

Y-12 CREDIT UNION MEET

Two directors and a credit committeeman will be named at Y-12's Credit Union meeting January 24, at 7 p.m., at Robertsville Junior High School.

New bylaws adopted by the credit union preclude nominations from the floor at the meeting. Nominations may be made, however, by petition, from 124 signatures from valid members.

The credit organization boasts more than 6,000 members.

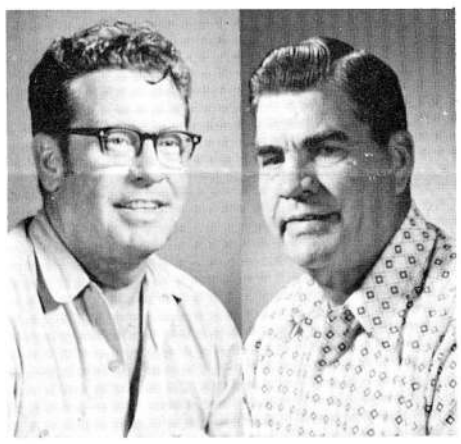
COMPANY Service 20 25 30

ORNL
30 YEARS

Luttrell Loftus

Frank S. Luttrell is a lieutenant in the fire protection and inspection department. A native of Knoxville, Luttrell lives on Bluegrass Drive in Concord. He and Alice, his wife, have two daughters.

James M. Loftus is a machinist in the Plant and Equipment Division. His main hobby is playing with his grandson and granddaughter. He and his wife, Hazel, live at 113 West Scott Avenue, Knoxville.



Cooper Keller

Norris H. Cooper, Plant and Equipment Division, is a native of Lenoir City. He and June, his wife, have a son, a daughter and two grandchildren. They live at 411 D Street, Lenoir City.

George E. Keller is the chief store keeper in the Finance and Materials Division. He and his wife, Bertha Mae, have two sons, a daughter and ten grandchildren. They live at 159 Johnson Road, Oak Ridge.

Orr Owsley

Porter B. Orr Jr., Chemical Technology Division, is originally from Asheville, N.C. He has a daughter who is an airline stewardess and a son who is an FBI agent. He and his wife, Alice, live at 4307 Crosby Road, Knoxville.

Russell C. Owsley is a boiler maker in the Plant and Equipment Division. He enjoys gardening and fishing in his spare time. He lives with his wife Mable in the Karns Community of Knox County.

Ragan Silverman

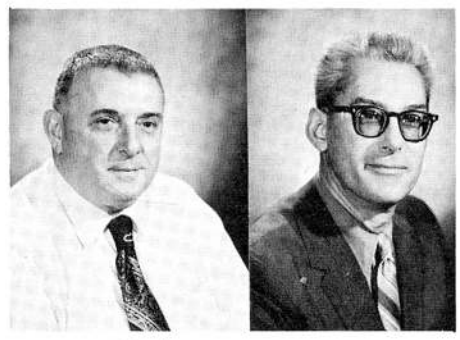
Willoughby Ragan Jr., is an instrument foreman in the Instrumentation and Controls Division. He and Kathryn, his wife, live at 1201 Dogwood Drive, Kingston. They have a son who is attending medical school.

Meyer D. Silverman, Reactor Division, is currently on loan to the Atomic Energy Commission's Regulatory Branch in Washington. Silverman is home at 397 East Drive, Oak Ridge, most weekends. He and wife, Dorothy, have a daughter and one grandson.

25 YEARS

Elliott D. Carroll, Howard F. Raby, John J. Tudor, Mary R. Ford and Herbert S. Linginfelter.

PADUCAH
30 YEARS



Clifford Mayer

Two Paducah veterans came with Union Carbide via the SAM Laboratories at Columbia University.

Charles B. Clifford, a native of Pennsylvania, is a graduate of Ohio State University. He lives at 4060 Buckner Avenue, Paducah, with his wife, Ruth.

Walter B. Mayer is also a graduate of Ohio State, and a native of Mansfield. He and his wife, Alice, one of the plant nurses at the Paducah Plant, live at Route 1, West Paducah. They have two sons, Tom and David. Mayer was recently chairman of the McCracken County School Board.

THE LAST WORD

The world is full of willing people; some willing to work, the rest willing to let them.

Work is the greatest thing in the world, so we should always save some of it for tomorrow.

To avoid criticism, do nothing, say nothing, be nothing.

Neutron spectrometer detects voids in irradiated material

FOCUS A BEAM — Herbert A. Mook is shown with a small angle neutron spectrometer which he installed at the Oak Ridge Research Reactor. A neutron beam from the reactor is focused by two nearly perfect germanium crystals contained in the round objects which he is adjusting here.

A physicist at Oak Ridge National Laboratory has suggested an alternative to the electron microscope for detecting the tiny radiation-produced voids that cause swelling in nuclear reactor materials.

Herbert A. Mook, Solid State Division, has found that for many investigations small angle neutron scattering may be better than electron microscopy, mainly because it is possible to observe smaller voids. Also, the material may be studied without sectioning it into thin slices.

Used at the ORR

Mook has installed a small angle neutron spectrometer at the Oak Ridge Research Reactor that has been used to observe voids in aluminum crystals. The spectrometer utilizes the focusing properties of nearly perfect germanium crystals and is capable of extremely high angular resolution with good neutron intensity.

Voids were produced in the aluminum crystals by irradiation in the High Flux Isotope Reactor. Volume changes were observed varying from 0.1 percent to 0.8 percent, depending on the dose rate. The small angle scattering from these crystals was measured over several orders of magnitude and the void size distributions were obtained by direct inversion of the scattering data. These size distributions were in good agreement with measurements made with electron microscopes on similar material except more voids of smaller sizes were observed.

Steel samples

The small angle spectrometer would be useful for measuring void distributions in samples like steel that become highly radioactive when irradiated, since in the perfect crystal technique the sample is not placed on a spectrometer but between the germanium crystals. This allows radiation shielding to be placed around the samples easily. In addition, since the neutron scattering cross section for iron is almost ten times that for aluminum, the small angle scattering technique would be ten times more sensitive for iron than for aluminum.

Small angle neutron scattering is greatly superior to small angle x-ray scattering because reactor materials have a much lower absorption for neutrons than for x-rays. Furthermore, long neutron wavelengths can be used to eliminate multiple scattering which makes interpretation of x-ray results very difficult.

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The Public Be Dimmed
You Can't Fuel All of the People All of the Time
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Join the Current Re-Volt
Power Shortages Leave Me Cold
Upon Atom
Coal: No Fuel Like an Old Fuel

RECREATIONOTES

ORNL BOWLING

The A League still belongs to the Misfits, nine and one-half points away from the Ten Pins.

The C League lead still belongs to the Remkeys, ahead of the Damagers by some three points.

In the Ladies' League, the top spot belongs to the Pick-Ups, six away from the HP-ettes.

Looks like the Oops team is still out front in the Carbide Mixed Family League.

ORGDP BOWLING

Bowlers are needed in the ORGDP Wednesday night league for the second half, beginning January 2. The league bowls at 5:45 at Ark Lanes. Contact Ted Bartlett, extention 3-3452, or Charles Hale, 3-3770, if you want a piece of the action. You may also call Recreation at 3-5833.

The Demons are still determined to take the first half, looks like. Tommy Crisp took honors on a recent night with a 254 game.

The Double X team stands a good chance of taking over a complete rout in the Tuesday league, leading by some 26 points. To date they hold the high team score of the season, a 3058 series!

ORGDP's Women's League gives the lead to the Payoffs, four points ahead of the Bowlettes. Sue Davis rolled a high game of 199 recently.

BASKETBALL

Initial standings in the Carbide Basketball League give initial wins to some new teams in both leagues.

– League standings follow:

ATOMIC LEAGUE

Team	W	L
Grundy Express	2	0
Has Beens	2	0
Underdogs	1	0
Bombers	1	0
Testers	1	1
G B U's	1	1
73'ers	0	1
Carbide Trojans	0	1
Electrodes	0	2
Possum Soup	0	2
NUCLEAR LEAGUE		
COE	2	0
Rolling Bones	2	0
Bottlenecks	1	0
Wildcats	1	0
Just-For-Fun	1	1
Chi-Town Hustlers	1	1
Eco-Trolls	0	1
H – Shift	0	1
Isomets	0	2
The Gunners	0	2

VOLLEYBALL

After two weeks of action, the Pack and Hawks tied for the lead in the Atomic League, and the Anti-Quarks and Over-the-hill Gang are sporting perfect records in the Nuclear League.

League standings follow:

ATOMIC LEAGUE

Team	W	L
Pack	6	0
Hawks	6	0
Old Men	5	1
The Gang	2	1
Taxi Squad	1	2
Jokers	1	2
Rad-Fizz	2	4
Funky Wambats	1	5
Electric Bananas	0	3
The Quarks	0	6
NUCLEAR LEAGUE		
Anti-Quarks	6	0
Over-the-hill Gang	3	0
Bawlers	4	2
Pogo's	4	2
Newcomers	3	3
Sloths	3	3
Artie's Army	1	2
The Neutrals	0	3
Bombers	0	3
TAT	0	6

SKEET LEAGUE

Vern Raaen, ORNL, fired high in November skeet circles, with a 47.507 tally. Y-12's Perry Bullard came in second with 47.469; and Bob Winkel, ORGDP, fired third with a 46.640.

A fire-safe Christmas is the happiest kind

Christmas is a beautiful time of year. It is a time for joy to the world and all of its people, a time for the exchange of gifts, the look on children's faces on that morning of mornings when the gifts are opened. It is also a time to count our blessings for the gifts we too often take for granted, the gift of health, seeing the snowflakes, hearing the Hallelujah chorus, feeling the crisp winter wind and enjoying the warmth of loved ones in a warm home.

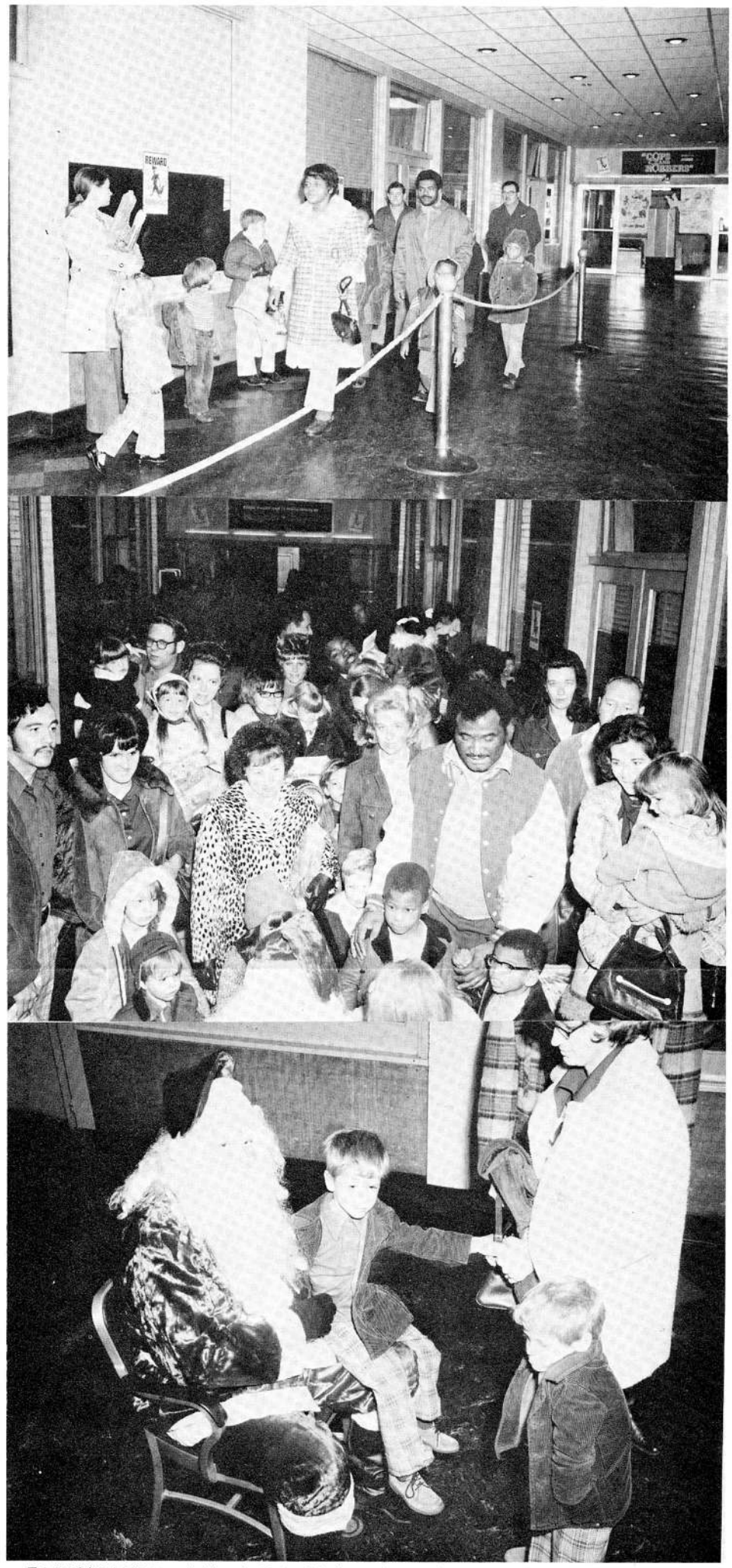
With all of the pleasure of the season, we tend to be careless and invite the danger of fire to ruin the happiness of the Yule time. Some of the things we can do to help make our Christmas safe from fire are mentioned here as a reminder:

Christmas trees should preferably be of the fireproof type. Check the container and be sure the word "fireproof" or similar wording is used. If you do use genuine tree, be sure it is fresh and ke the trunk in water. Cut the trunk ir "V" shape to expose more surface to the water. Be sure to check the water level regularly as the tree will absorb a great amount of liquid.

Use only tree lights that have the Underwriters' approval on them. If they have been around for some time, be sure the cords and sockets are in good condition. Don't leave tree lights on all night, and keep the tree away from heaters and air ducts that are likely to dry it out too quickly. Do not use combustible decorations such as cotton and paper on the tree. Check the tree regularly to see if it is drying out, and dispose of the tree immediately after Christmas. Be sure to dispose of wrapping paper properly after packages have been opened.

Don't use lighted candles; they invite trouble. Be careful of smoking and matches, not only during the holidays but every day.

Have a merry and fire-safe Christmas.



EARLY SANTA — Jolly ole Saint Nick paid an early visit to Carbide children in the Paducah area recently, showing up at the Arcade Theater there. Above are some scenes from the gala gathering.

Y-12 BOWLING

The Ridgers calmly claim the top notch spot in Classic bowling, four and one-half ahead of the Eightballs. J. D. Franklin has rolled a 257 scratch game to date.

The Mini Strikes control the helm of the C League, a leap ahead of the Rounders. Bill Ladd rolled a 226 game of late.

The Splinters - Karen and Joe Sherrod, Vivian and Bill Butturini - took the Mixed League's first half crown, downing the Rollers in the final night of action. The men and women of this league got an early start into the second half this week.

Eloquence is saying the proper thing and stopping.

The wise man weighs his words on the goldsmith's scale.

Think twice before you speak once and you will speak twice the better for it.

When there is a gap in the conversation, don't put your foot in it.

The man that talks much about himself will have a tired audience.

It is with marriages as with cages; the birds outside despair to get in, and those within despair to get out.

Montaigne

The pluses and minuses of cycling

(Editor's Note: Dr. Lincoln alternates his regular column with "The Medicine Chest," where he answers questions from employees concerning their health in general. Questions are handled in strict confidence, as they are handled in our Question Box. Just address your question to "Medicine Chest," NUCLEAR DIVISION NEWS, Building 9704-2, Stop 20, or call the news editor in your plant, and give him your question on the telephone.)

By T. A. Lincoln, M.D.

During 1972, 13.7 million bicycles were sold and the boom, begun about five years ago, may accelerate because of the gasoline shortage. Last year there were about as many bicycles sold as automobiles and they are now approximately equal in number in the United States. The Bicycle Institute of America says that there are 83 million people currently riding bicycles and this number will increase to 100 million by 1976. The health benefits and, unfortunately, the risks will abound during such a use "explosion."

Although children and adolescents have always ridden bikes, the tremendous upsurge in adult cycling probably reflects an increasing awareness of the psychological and physical values of fitness. Its social acceptability as the "thing to do" and the great improvements in bicycle technology also have played an important role. The three-, five-, and ten-speed bikes enable even "creaky" adults to cycle up hills without dismounting.

Many short trips

Sixty percent of all auto trips are five miles or less, 40 percent are four miles or less and eight out of ten of them are made by the driver alone. Now with gasoline rationing a likely prospect, the family car cannot be used for so many short trips. Most of these are well within the practical range and carrying capacity of the average bike rider. Baskets and carriers are available which enable transporting groceries and other shopping items. Three wheeled bikes with baskets on the back have become popular with retired people in Florida.

The value of exercise and fitness need not be repeated here. There are, however, certain special advantages to cycling. Many adults, especially if they are over 40, experience all sorts of muscle and joint problems in their legs when they jog or play group sports like volleyball, tennis, and basketball. During these activities, the body weight, and unfortunately this is usually an EXCESS weight, pounds down through the hip, knee and ankle joints with each step, causing irritation and injury. Sudden stops, starts or twists in several of these sports may also cause sprains and strains.

During cycling most of the stress occurs in the large muscle groups in the buttocks, thighs and legs. The knees often feel "trembly" after the first day's outing, but most of the knee stress is related to muscle use. The joint is spared. Tom Chlapecka, a jogger in the Research Department of the National Safety Council, reports that the only way he could get rid of chronic shin splints was to mix his jogging with some cycling.

The major hazard from cycling is a collision with an automobile. In 1972, there were 1,100 deaths and 40,000 reported injuries that disabled the rider for at least one full day. There were a great many injuries that were not reported since they did not involve collision with an automobile and were not investigated by the police. There is evidence to believe that maybe 300,000 injuries requiring a physician's attention may occur each year.

Cycling hazards

The front wheel of a bicycle sometimes drops through a sewer grating where the grates are far enough separated and run parallel to the street. The result is usually a thrown rider. Occasionally cyclists crash into a car door that is suddenly opened on the street side. Excessive speed down hills can lead to loss of control, especially if a sudden swerve is necessary.

The solution to the safety aspect of cycling is not easy. The obvious answer is the establishment of bikeways along streets which lead to shopping centers and schools. Bike trails out in the country built on abandoned railway right-of-ways are fine but would require automobile transportation to get to them. The costs of most in-town bikeways are not exorbitant and can sometimes be combined with existing sidewalks in areas where little walking is done anyway.

Bikeways help

Bikeways do reduce accidents. In Davis, Calif., a city of 31,000 people with 22,000 registered bicycles, 74 bicycle accidents occurred over a two-year period, but only two of these occurred in a specified bicycle lane.

The recent popular acceptance of bike flags should help reduce accidents. These brightly colored pennants fly from the top of a tall flexible mast. They enable motorists to see the cyclist at a greater distance, especially if he is over the top of a hill or ahead of several cars in a lane of traffic.

"Energy" required

With the energy crisis on everyone's mind, it is worth considering the energy required to propel a bicycle. Mild cycling uses up to an average of five calories per minute and going up a hill requires 10 to 15. Most adults have excess calories conveniently "packaged" in fat around their waistlines or hips. This reserve fuel tank is always full! If you can't control your appetite, consider how you can burn up your excess calories. If you only do light work, multiply your optimum weight by 15 and you will have the approximate number of calories you will require to maintain that weight. Thus you will probably find that you can propel your bike with the "extra" calories that you now consume.

Cycling is a healthy and efficient form of transportation if it can be made safe. Bikeways appear to be the best answer.

WRITING CLASS IN ACTION — Yvonne Lovely, ORNL, led discussion in ORGDP's "The Business of Writing" course conducted recently. Dan Johnson, who served as program coordinator, is standing to the left of Mrs. Lovely. Students are, clockwise from upper right, Millard Gibson, Claude Smith, Jim Murray, Ken Bane, Bill Hall, Mary Phillips, Frank Keylon, Cecil Watson, Paul Sherrill, Louis Alley, Don Tevault, Ken Davis and Bill Kelley.

Course in business of writing completed by ORGDP employees

Three sessions of a course entitled "The Business of Writing," have been offered to ORGDP employees interested in improving their writing skills.

The Industrial Relations Division, through the Personnel Development and Training Department, offered the course after regular work hours to interested employees. Dan Johnson served as coordinator and technical assistant, and Yvonne Lovely, ORNL, was discussion leader for the sessions.

Employees who received certificates for completion of the course and their divisions are listed below.

Barrier Manufacturing: Larry E. Abbott.

Fabrication and Maintenance: Louis Alley, Kenneth E. Bane, Jack Duncan, Ken Davis, Charlie L. Eller, Millard J. Gibson, Albert F. Griffin, Kenneth O. Hackworth, Lee Halstead, James E. Heiskell, Bill C. Kelley, Frank Keylon, Ed H. Kreig Jr., Glenn Longmire, James C. Murray, John H. Purnell, Barbara L. Richmond, George C. See, Frank Settle, Paul K. Sherrill, Jerry L. Sluder, Claude B. Smith, William J. Weeks, Cecil A. Watson and Herschel E. Williams.

Finance, Materials and Services: Harold E. Alexander, James E. Bradshaw, Virginia H. Bullock, Don H. Graves, William E. Hall, Mary B. Phillips, Lester H. Riggs, Luther B. True and Richard C. Wood.

Industrial Relations: Herb F. Hingdon, Dan Johnson, Charles R. Levenhagen, Gladys D. Manis, Scarlette M. Osborne, Robert L. Phillips, Wanda C. Powers and Neil B. Schultz.

Operations: Lester D. Blakeney, Lola C. Byrd, William A. Davis, Frances P. DeLozier, Trewhitt Hope, Judy B. McBee, Tom H. Monk, Gary P. Patterson, Jack T. Roylston and Don J. Tevault.

Plant Superintendents: Joan E. Cantrell, Bobbye W. Curtis and Sandra K. Whitaker.

The writing course was developed by Michael E. Adelstein, a professor of English at the University of Kentucky. The eight 30-minute video tape lessons used in the course were produced for the Kentucky Training and Development Foundation by Kentucky Educational Television. A textbook accompanied the course. Each lesson was followed by an hour-long discussion period.

The course dealt with writing principles: writing correctly, clearly, concisely, interestingly, persuasively, and writing letters and reports.

Future sessions of the course may be offered if there is sufficient interest. Employees interested in taking the course should call 3-3161.

THE LAST WORD

You must admit that prejudice is a great time-saver. It enables you to form an opinion without bothering to get the facts.

Accounting refresher class offered by Oak Ridge NSA

The Oak Ridge Chapter of the National Secretaries Association will sponsor a five-week course entitled "Financial Analysis and the Mathematics of Business." The course, which is fourth in a series of six courses programmed for preparation in taking the certified professional secretaries examination, will be held January 14 through February 11, 1974.

Yvonne Lovely, an ORNL employee, will serve as instructor of the course which will be held each Monday from 6:30 to 8:30 p.m. at the Oak Ridge High School.

The course will serve as an intensified accounting refresher and should be of interest to many who do not plan to take the CPS examination.

Pre-registration should be made through Bettye Burns, CPS service chairman, extension 3-1306.

Other courses to be offered include: business law, February 18-March 18; and communications and decision making, March 25-April 22.

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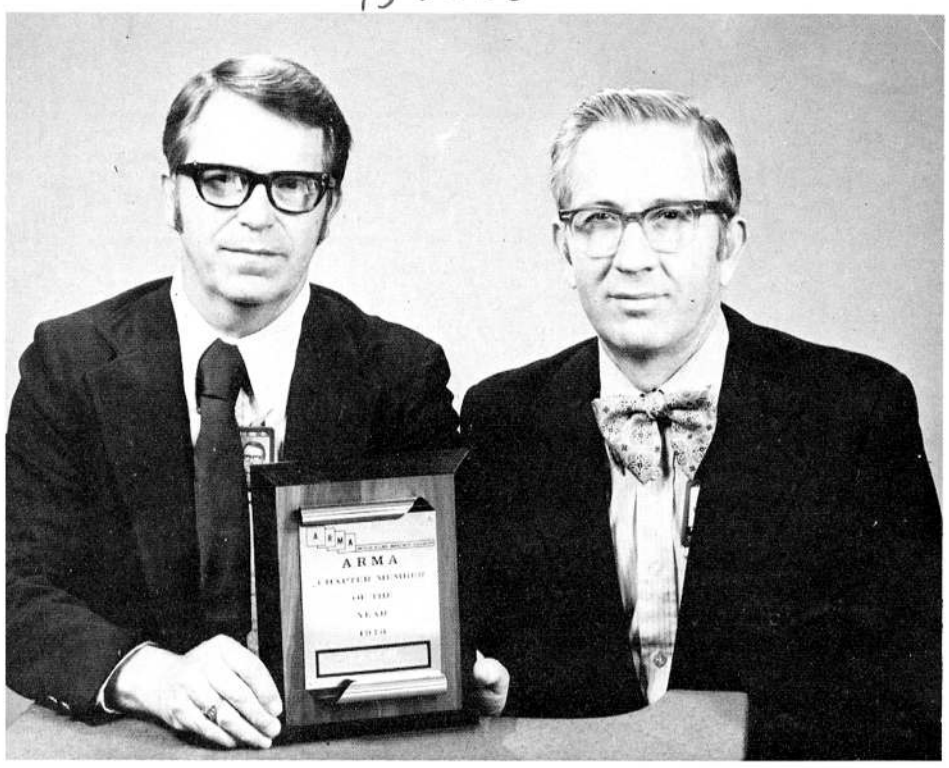


ARMA CHAPTER EARNS AWARD — Kenneth B. McNabb, right, of Y-12 Plant's Materials and Services Division, recently received the chapter member of the year award from the American Records Management Association (ARMA) for outstanding work in the East Tennessee chapter. The award was presented by the ET chapter president, L. "Buck" Davis, also of Materials and Services. The ARMA was founded in 1956 to promote a scientific interest in records management, to broaden the scope of service of records managers, to develop standards and to provide a forum for the exchange of ideas and techniques in the art of records management.

UT to start noncredit program in Oak Ridge

QUESTION BOX ? ?

(Continued from page 1)

The University of Tennessee is launching a noncredit program in Oak Ridge with the start of the winter quarter, according to David N. Bean, associate director of The University Evening School.

Bean said that as a special service to the Oak Ridge business and industrial community, a supervisory skills program, entitled "Management and Supervisory Concepts," will be offered Tuesday evenings at the Oak Ridge High School.

Registration for the noncredit course can be completed weekdays from 8 a.m. to 5 p.m. through January 4 at the Oak Ridge High School.

The course, to be taught by Don Vernine, is designed to provide practical and theoretical training required for managers and supervisors. Among the items to be covered are: the role of the supervisor; understanding and motivating people; communications and interpersonal relationships; leadership; planning for effectiveness; decision-making techniques; and the management process.

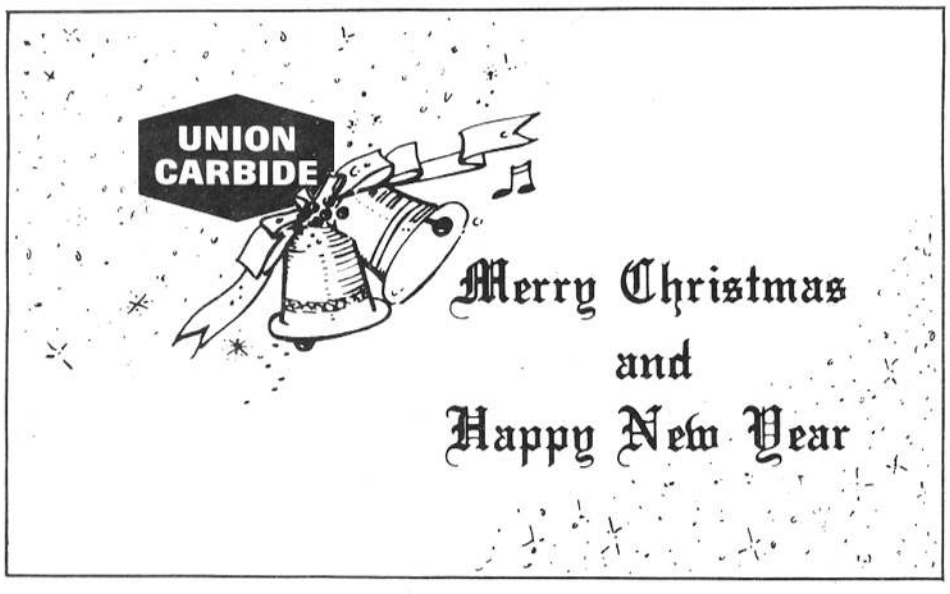
The evening school has many other unusual noncredit courses planned for the winter quarter. Included are gourmet chinese cooking, wine appreciation, kung fu advanced karate, preventive self-defense, paddleball, searching for your ancesters, the new woman and yoga.

Further information can be obtained by contacting: Training Department, 3-7856, Y-12 Plant; Jan Wing, 3-3161, ORGDP; and the personnel development and systems department, 3-6801, ORNL.

chairman to enforce a "no smoking" rule in a meeting room, your letting your fellow employees know the effects of excessive smoking in a meeting room should result in more favorable consideration. You may wish to suggest to the group that the effects of excessive smoking be a subject of a future safety meeting. We do not think that separate meetings would be practical.

THE LAST WORD

Conceit is an odd disease - it makes everybody sick but the one who has it.



COMPANY Service 20 25 30

Y-12 PLANT
30 YEARS

Mrs. Messamore

Lennie L. Messamore, Metal Preparation, reached 30 years' service in November. She is a native of Benton, Tenn., and lives at 2506 Underwood Place, Knoxville.

In addition, six other Y-12ers cross their 30-year landmarks in late December.

Howard M. Burnett, Metal Preparation Division, lives at 105 Ogontz Lane, Oak Ridge.

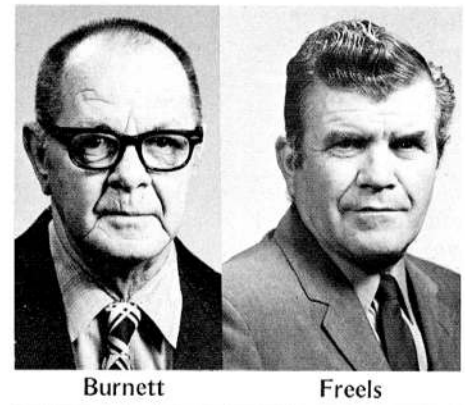
The Shift Superintendents and Utilities Division's Roy D. Freels, lives at Route 1, Sunbright, Tenn.

William D. Harman is in the Product Certification Division. His home is at 117 Park Lane, Oak Ridge.

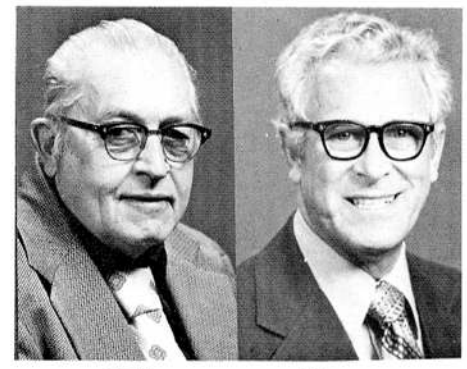
Clifford Holt of the Maintenance Division lives at Route 27, Palmyra Drive, Knoxville.

William T. Mitchell, also in the Maintenance Division, lives at 109 Morris, Oak Ridge.

Materials and Services Division's Charles L. Stuckey lives at Route 6, Clinton.



Burnett Freels



Holt Harmon

Mitchell Stuckey

THE LAST WORD

"I love the Christmas-tide, and yet,
I notice this, each year I live:
I always like the gifts I get,
But how I love the gifts I give!"
Carolyn Wells

20 YEARS

Carl R. Hudson, Mark S. Grim Jr., Vernon J. Harber, Stanley L. Jamruz, Earl A. Tweed, Eugene F. Dalton and Columbus Owens.

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